

## 1.1 Biological Impacts

### 1.1.1 Updates to Annual Catch Limits

#### 1.1.1.1 Option 1: No Action (ACL= ABC of 35,479 mt, ACT of 27,275 mt, TAL of 18,001 mt, Wing TAL =11,169 mt, Bait TAL 5,626 mt)

The No Action alternative would maintain the ACL specifications as those established in Framework 2 (NEFMC, 2014). This would allow a higher than recommended catch. Barndoor, thorny and smooth skates are in rebuilding plans. Overfishing is no longer occurring on thorny skate, however, the 0.1 kg/tow increase in survey indices in 2014 does not indicate a vast improvement in rebuilding. Allowing a higher ACL than is deemed appropriate by the survey indices (See Option 2, ACL=31,081), could hinder rebuilding of species. This alternative would not incorporate the best available science; it would not utilize the most recent survey indices or revised discard mortality rate estimates for trawl gear. Therefore, the No Action alternative would have a moderate, negative impact on the skate resource. Option 1 would also have a moderately negative impact on the skate complex when compared to Option 2.

#### 1.1.1.2 Option 2: Revised Annual Catch Limit Specifications (ACL= ABC of 31,081 mt, ACT of 23,311 mt, TAL of 12,872 mt, Wing TAL =8,560 mt, Bait TAL 4,312 mt)

Option 2 would revise the ACL for the skate complex using the most recent best available science – revised survey indices and discard mortality rate estimates. The revised ACL was calculated using the revised median catch/biomass exploitation ratio (updated with the revised discard mortality rate estimates for scallop dredge gear for little and winter skates) and the most recent 3 year moving average of the relevant NEFSC trawl survey (Table 4). Catches at or below the median catch/biomass exploitation ratio have shown a tendency for biomass to increase more frequently and by a greater amount than catches that were above the median exploitation ratio [see Appendix I of Amendment 3 (NEFMC 2009)].

The biological impacts of the ACL and allocations to discards and catch result mainly from preventing overfishing and keeping catches below a level that has been shown in Amendment 3 to produce larger and more frequent increases in skate biomass<sup>1</sup>. Variations in landings and discards may cause catch to exceed the ACT and any overages of the risk-adverse ACT will be absorbed by the 25% management uncertainty buffer. Any overages of the ACL will trigger accountability measures. Thus it is highly unlikely that skate catches will exceed the ACL. A more detailed review of this analysis is given in Appendix 1, Document 4 of Amendment 3 (NEFMC 2009).

Skates are ubiquitous in most fisheries and are caught by most gear types. A smaller number of trips landed the full wing possession limit, in either season 1 or season 2, indicating a smaller directed fishery (Figure 1 and Figure 2); the majority of landings were below the incidental wing possession limit, suggesting that the incidental fishery takes advantage of the additional revenue from skates. The impact on fisheries is a little uncertain; the wing fishery had not achieved its TAL between FYs 2010 and 2013, however, it achieved 97.3% of the TAL in FY 2014 (Table 1). If the assumption is made that FY2014 is more representative of the current wing fishery, then the reduced ACL may affect fishing (both incidental and directed). The reduced ACL may impact fisheries that also land skate, e.g. monkfish because of the high levels of skates also caught in this fishery. The bait fishery achieved the highest level of its TAL in FY 2010 (98.5%) but has achieved less than 85% in subsequent fishing years suggesting bait fishery operations may not be as negatively impacted by the revised specifications (Table 2).

---

<sup>1</sup> Projections based on analytical models are not available however because the attempted analytical stock assessment models have not been reliable for management (NEFSC 2007b).

**Table 1 – Landings and percent of TAL achieved in the wing fishery between FY2010 and FY2014**

<b>Fishing year</b>	<b>TAL</b>	<b>Landings</b>	<b>Percent of TAL</b>
<b>2010</b>	9209	4330	47
<b>2011</b>	14338	11790	82
<b>2012</b>	15538	10113	65
<b>2013</b>	14338	7981	56
<b>2014</b>	11169	10605	97

**Table 2 – Landings and percent of TAL achieved in the bait fishery between FY2010 and FY2014**

<b>Fishing year</b>	<b>TAL</b>	<b>Landings</b>	<b>Percent of TAL</b>
<b>2010</b>	4,639	4,571	99
<b>2011</b>	7223	4132	57
<b>2012</b>	7827	5504	70
<b>2013</b>	7223	5596	77
<b>2014</b>	5626	4499	82

The decrease in ACL would be expected to positively impact overall skate biomass based on the relationship between catch and biomass. The decreased ACL would potentially decrease overall skate landings, however, the extent of such a reduction is uncertain as it depends on the ability of the wing fishery to achieve its TAL, which would result in low positive impacts. However, reduced landings may increase discards. Increased discards of targeted skates in the wing fishery would occur if the incidental trip limit was triggered early in the fishing year; once 85% of the wing TAL is achieved in-season, the RA has the discretion, based on projections, to allow fishing to continue or to implement the incidental trip limit. Increased discards would increase the proportion of dead discards, which could have further impacts on the TAL when setting specifications (e.g. discards increased from the 2014-2015 specifications, which contributed to lowering the TAL). Recent work on discard mortality rate estimates of winter skate and little skate have resulted in reductions from the assumed discard mortality rate estimates (50%) for scallop dredge gear established in A3 to 34% and 48%, respectively. Total and dead skate discards increased in 2013 and 2014 (Table 3) despite no large changes occurring in the distribution of pounds of skate landed in recent fishing years (Figure 1, Figure 2, Figure 4).

**Table 3 – Total and dead skate discards for calendar years 2012 - 2014**

<b>Year</b>	<b>Total Discards (mt)</b>	<b>Dead Discards (mt)</b>
<b>2012</b>	36277	10270
<b>2013</b>	42716	12093
<b>2014</b>	42732	12098

A certain level of discarding is expected as landing barndoor, thorny and smooth skate (in the GOM) is currently prohibited. Only if effort shifts away from where these species are found could a change positively impact these species. Therefore we expect a neutral impact on the skate resource, and minor positive impacts when compared to the No Action.

**Table 4 -** Current and proposed 2016-2017 specifications including changes in input parameters: C/B exploitation medians, updated stratified mean biomass in FSV Albatross IV units, and an average mean discard mortality rate weighted by estimated discards by species and fishing gear.

	<b>Current Specifications 2010-2012 survey; 2010-2012 discards</b>	<b>Proposed 2016-2017 Specifications 2012-2014* survey; 2012-2014 discards</b>
--	--	--

<b>ACL specifications</b>		
ABC/ACL (mt)	35,479	31,081
ACT (mt)	27,275	23,311
TAL (mt)	18,001	13,216
Assumed state landings	1206	344
Federal TAL	16,795	12,872
Wing TAL	11,169	8,560
Bait TAL	5,626	4,312
<b>C/B medians</b>		
Barndoor	2.64	2.76
Clearnose	3.98	3.35
Little	2.14	2.09
Rosette	2.57	2.51
Smooth	2.80	2.74
Thorny	1.27	1.40
Winter	1.83	1.91
<b>Survey biomass (mean kg/tow)</b>		
Barndoor	1.22	1.62
Clearnose	0.97	0.61
Little	7.11	6.82
Rosette	0.033	0.053
Smooth	0.23	0.22
Thorny	0.18	0.21
Winter	6.68	6.95
<b>Discard rate</b>	34%	43%

\* 2015 spring survey index used for little skate

### 1.1.2 Skate Wing Possession Limit Alternatives

#### 1.1.2.1 Option 1: No Action – 2,600 lbs from May 1 to Aug 31; 4,100 lbs from Sept 1 to Apr 30

The No Action alternative would keep the current possession limits as set in Framework Adjustment 1. An analysis conducted in FW1 indicated that mortality decreased as possession limits decreased. This alternative therefore is expected to have low negative impacts on the skate complex when compared to Option 2 because this option allows a higher possession limit, but more positive impacts when compared to Option 3. In 2010, wing possession limits were set at 5,000 lbs that resulted in a short directed fishery before the 85% TAL trigger was reached resulting in an incidental trip limit of 500 lbs for the remainder of the fishing year. The incidental trip limit, if triggered early in the season, can greatly increase skate discards and could hinder more profitable fishing if a high level of skate is encountered that can't be landed and makes fishing difficult. Therefore the No Action alternative would have positive impacts when compared to Option 3.

The skate specifications methodology was designed to prevent overfishing of the skate complex. Provided the wing fishery does not exceed its TAL, this alternative would not be expected to negatively impact the skate complex. Approximately 97% of the wing TAL set in the in FW2 was achieved in FY2014, revised specifications outlined in Section **Error! Reference source not found.** represent a reduction of approximately 12% in ABC but approximately a 20% reduction in wing TAL. If FY2014 is more representative of the current fishery, the proposed wing TAL could be exceeded in FY2016 and FY 2017. Option 1 would also be more likely to result in the implementation of the incidental trip limit before the end of the fishing year if more of the TAL is achieved as in FY2014. This would be expected to increase discards and would result in low negative impacts to the skate resource. Any overages of the risk-adverse ACT will be absorbed by the 25% management uncertainty buffer. Any overages of the ACL will trigger

accountability measures. Thus, overall, it is highly unlikely that skate catches will exceed the ACL. It is not possible to predict future fishing behavior, which results in a potential range of biological impacts. If a lower amount of the wing TAL was achieved as in FYs2010-2013, Option 1 would have low negative impacts. However, if a higher amount of the wing TAL was achieved as in FY2014, this alternative would have low to moderate negative impacts on the complex.

#### 1.1.2.2 Option 2: Revised Skate Wing Possession Limit – 1,500 lbs from May 1 to Aug 31; 2,400 lbs from Sept 1 to Apr 30

Option 2 would reduce the trip limits to a level that would not trigger the incidental trip limit. The limits were set to prevent overages of the TAL, not reduce overall effort on skate. This measure would reduce directed effort and allow the fishery to be executed for the entire fishing year, however, it is likely to increase discards of skate and not impact overall skate effort. It would be expected to have a positive impact on the complex as skate mortality is expected to decrease with decreasing possession limits (FW1; NEFMC, 2011).

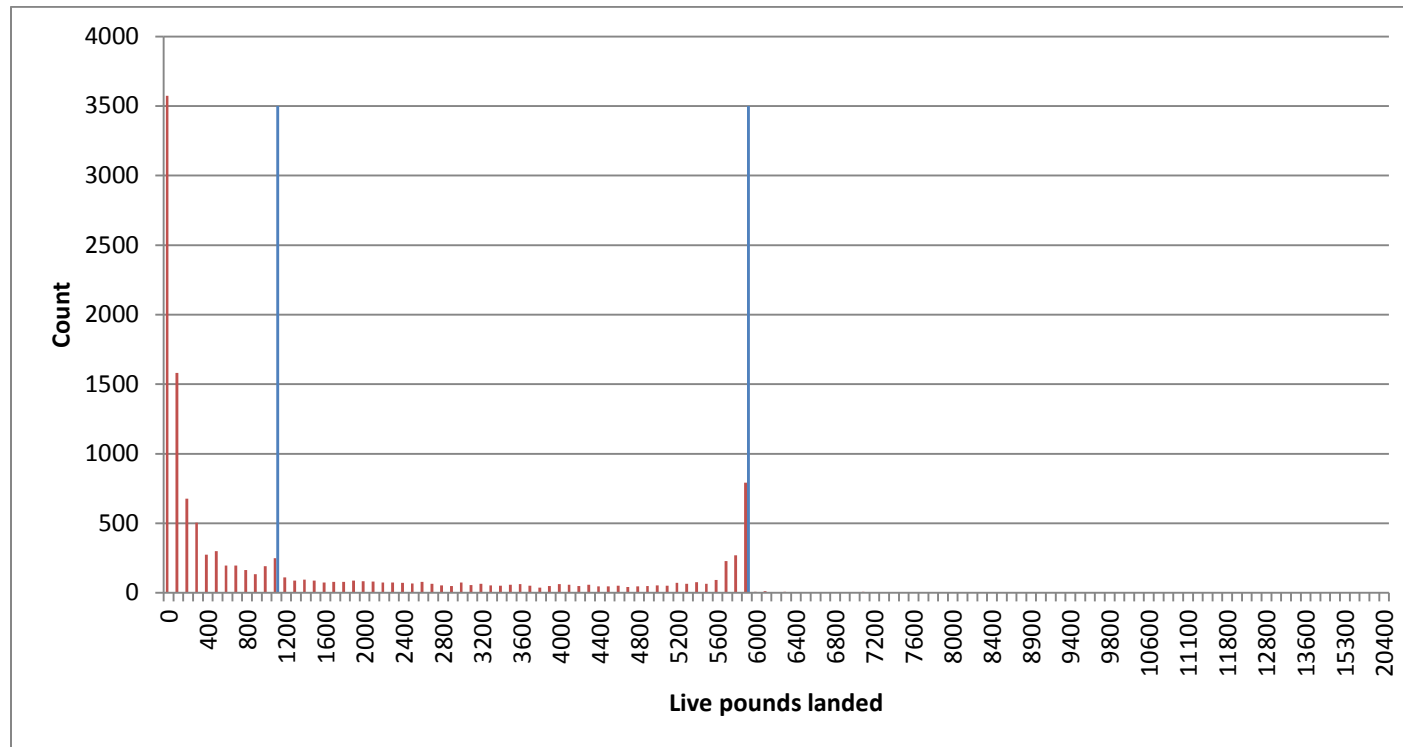
The main biological effect of the skate wing possession limit is on the discard mortality, as a proportion of total catch. With a low possession limit, the fishery may not be able to land the allocated TAL and optimum yield will not be achieved. With a high possession limit, the fishery may reach the 85% TAL trigger early in the season (as it did during FY 2010) and skates will be discarded on trips that target other species and whose catch exceeds the 500 lbs. incidental skate wing limit<sup>2</sup>. In FY2014, 85% of the wing TAL was achieved in February, however, the fishery was not projected to exceed the TAL and the incidental trip limit was not implemented. The TAL trigger results in a 500 lbs trip limit for the remainder of the FY resulting in the closure of the directed skate fishery. This effect may be exacerbated by vessels fishing for skates in state waters in response to the stricter skate regulations in Federal waters and by vessels that target other species in lieu of skates, but continue to discard incidental catches of skates. In order to minimize biological impacts on skates and other species, the skate wing possession limit should be set at a level that will 1) allow the fishery to take the skate wing TAL and 2) will not close the directed skate fishery early. It is also possible that the effects on barndoor, smooth, and thorny skates will be greater if the skate fishery closes early and vessels shift effort onto other species that may have a greater interaction with these skates.

Based on an examination of seasonal wing landings for FY2011 and FY2012 combined, approximately 2,745 trips would have exceeded the proposed trip limits under Option 2, compared to over 9,000 below the season 1 possession limit (Figure 1 and Figure 2). Depending on the level of fishing activity, this alternative may impede the fishery from landing its TAL (FY2010-2013 conditions) or it may reduce the likelihood of the incidental trip limit being implemented before the end of the fishing year (FY2014 conditions).

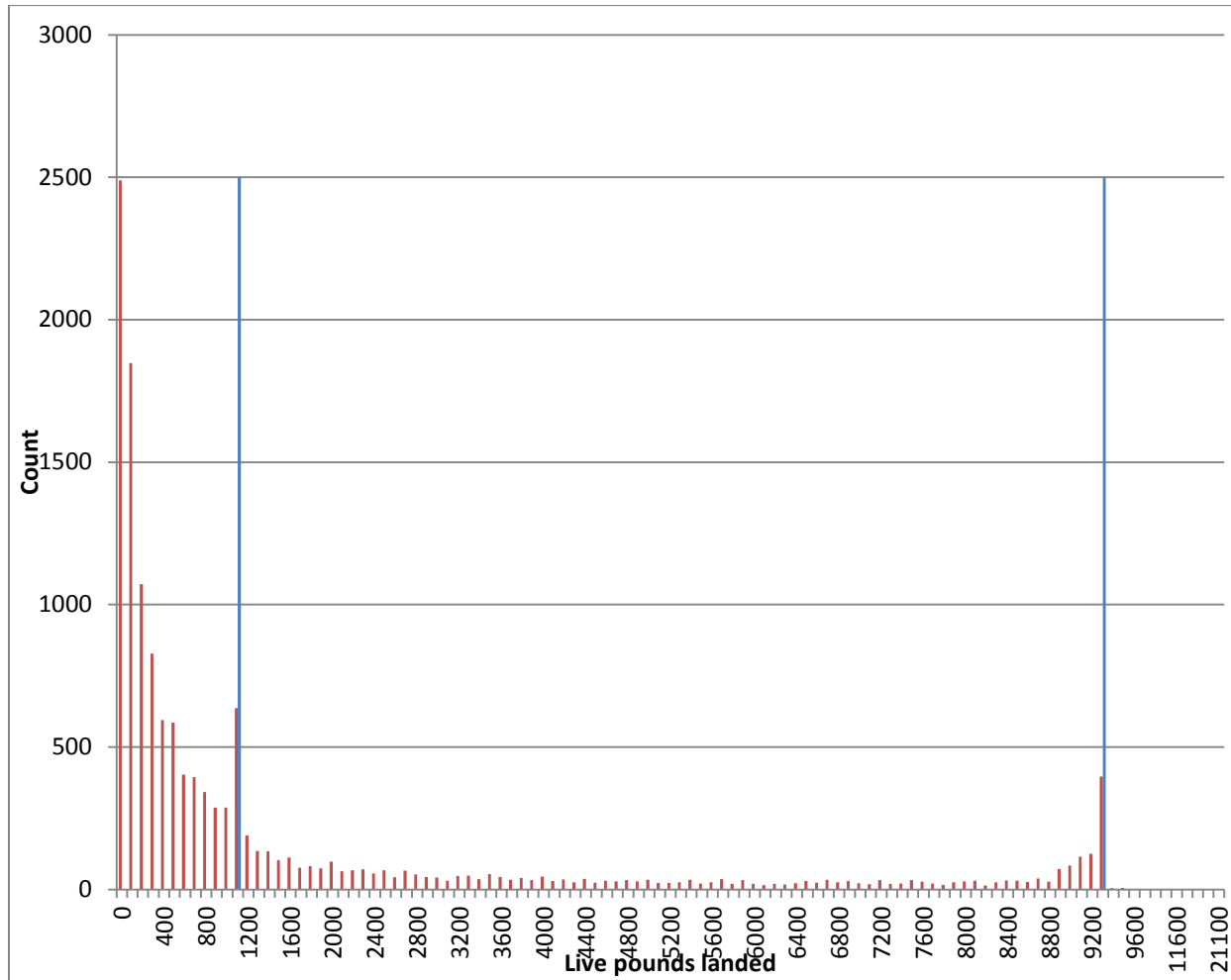
---

<sup>2</sup> Framework Adjustment 1 (NEMFC 2011) considered and proposed raising the incidental skate possession limit from 500 to 1,250 lbs. to reduce discards but this measure was disapproved by NMFS.

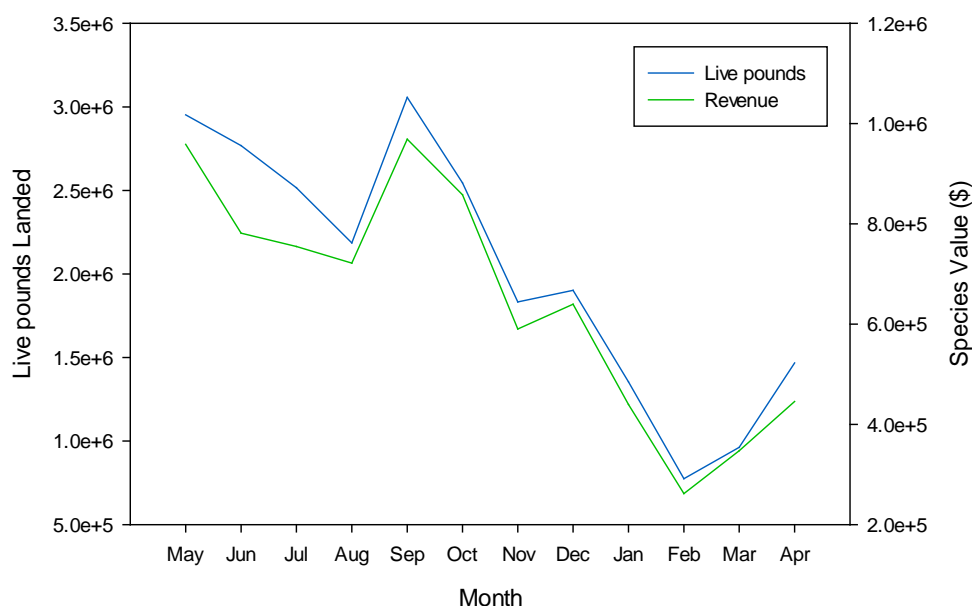
**Figure 1- Frequency of trips landing wings (disposition food) by weight for FY 2013 and FY 2014 in Season 1 (May 1 – August 31)**



**Figure 2 - Frequency of trips landing wings (disposition food) by weight for FY2013 and FY2014 in Season 2 (Sept 1 - Apr 30)**



Examining the relationship between monthly landings and price shows a similar trend in live pounds landed and species value in FY2014 (Figure 3). The fishery landed more skate at the beginning of the fishing year under the lower trip limit. In FY 2014, there could be more vessels landing skates, existing vessels in the skate fishery took more trips, or vessels landed more of their skate catch when targeting other species. The only changes in impacts caused by the first two responses above are economic. The last response (landing more skates that are caught while targeting other species) might not change the amount of skates captured, but fewer skates would be discarded (and, as a result, fewer would as a result survive when the discard mortality is less than 100%). Option 2 would have slightly more positive impacts compared to Option 1 and 3 because of decrease possession limits which are expected to decrease mortality.



**Figure 3 - Relationship of live pounds landed and species value in FY2014**

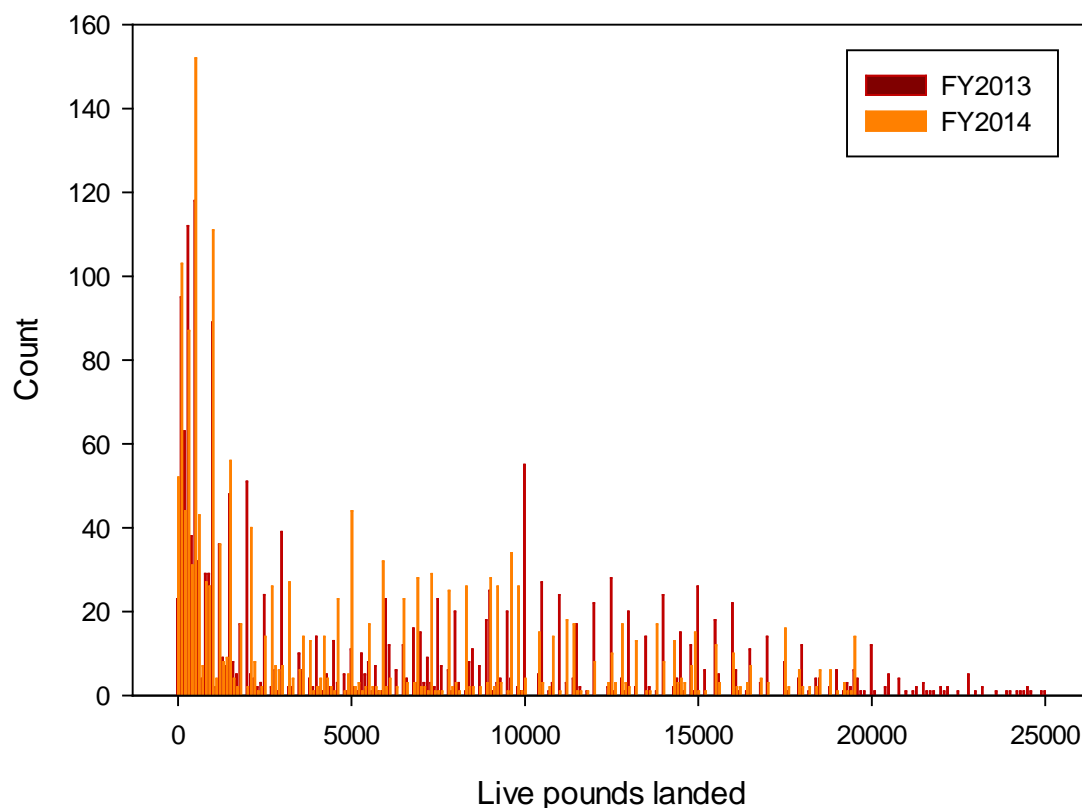
### 1.1.2.3 Option 3: Revised Skate Wing Possession Limit – 5,000 lbs year round

This Option would result in a higher trip limit that was maintained throughout the year. This Option would be expected to have greater negative biological impacts than Options 1 and 2. This Option would be more likely to result in an overage of the TAL and triggering of the incidental trip limit (**Error! Reference source not found.**) when compared to behavior in previous fishing years. In 2010, wing possession limits were set at 5,000 lbs that resulted in a short directed fishery before the 85% TAL trigger was reached resulting in an incidental trip limit of 500 lbs for the remainder of the fishing year. The incidental trip limit, if triggered early in the season, can greatly increase skate discards and could hinder more profitable fishing if a high level of skate is encountered that can't be landed and makes fishing difficult. The trip limits were designed to prevent an overage of the TAL and not to reduce fishing effort on skate. This Option would not prevent the likelihood of overfishing occurring on a species; after the incidental trip limit was triggered, the level of discarding of skate would increase. The incidental trip limit would reduce directed skate trips but could shift effort onto other species managed under other FMPs. Therefore Option 3 would have a moderate negative impact on the skate resource and greater negative impacts compared to Options 1 and 2.

### 1.1.3 Bait Possession Limit Alternatives

#### 1.1.3.1 Option 1: No Action – 25,000 lbs year round

This alternative would maintain the skate bait possession limit at 25,000 lbs. An analysis conducted in FW1 indicated that mortality decreased as possession limits decreased. This alternative therefore is expected to have low negative impacts on the skate complex when compared to Option 2. However, the skate specifications were designed to prevent overfishing of the complex. The bait fishery has not exceeded its TAL in recent fishing years (Table 2). The frequency of trips landing bait by weight exhibited a more varied distribution than seen in the wing fishery (Figure 4). Provided the bait fishery does not exceed its TAL, this alternative would have minimal impacts to the skate complex. This alternative would have neutral to low negative impacts on the complex because it would not cause the skate bait TAL to be exceeded.



**Figure 4 – Frequency of trips landings bait by weight for FY2013 and FY2014**

#### 1.1.3.2 Option 2: Revised Skate Bait Possession Limit – 20,000 lbs year round

This Option would reduce the skate bait possession limit to 20,000 lbs. An analysis conducted in FW1 indicated that mortality decreased as possession limits decreased. Because this alternative would reduce the possession limit a small reduction in mortality would be expected. This alternative therefore is expected to have low positive impacts on the skate complex when compared to Option 2. However, the skate specifications were designed to prevent overfishing of the complex. The bait fishery has not exceeded its TAL in recent fishing years. In order to achieve its TAL, the bait fishery may compensate for the reduced possession limit by increasing the number of trips taken, depending on the level of costs associated with extra trips and availability of DAS for more profitable fishing activity. Provided the bait fishery does not exceed its TAL, this alternative is not expected to negatively impact the skate complex. This alternative would have neutral to low positive impacts on the complex because it may cause the skate bait TAL to be underachieved.

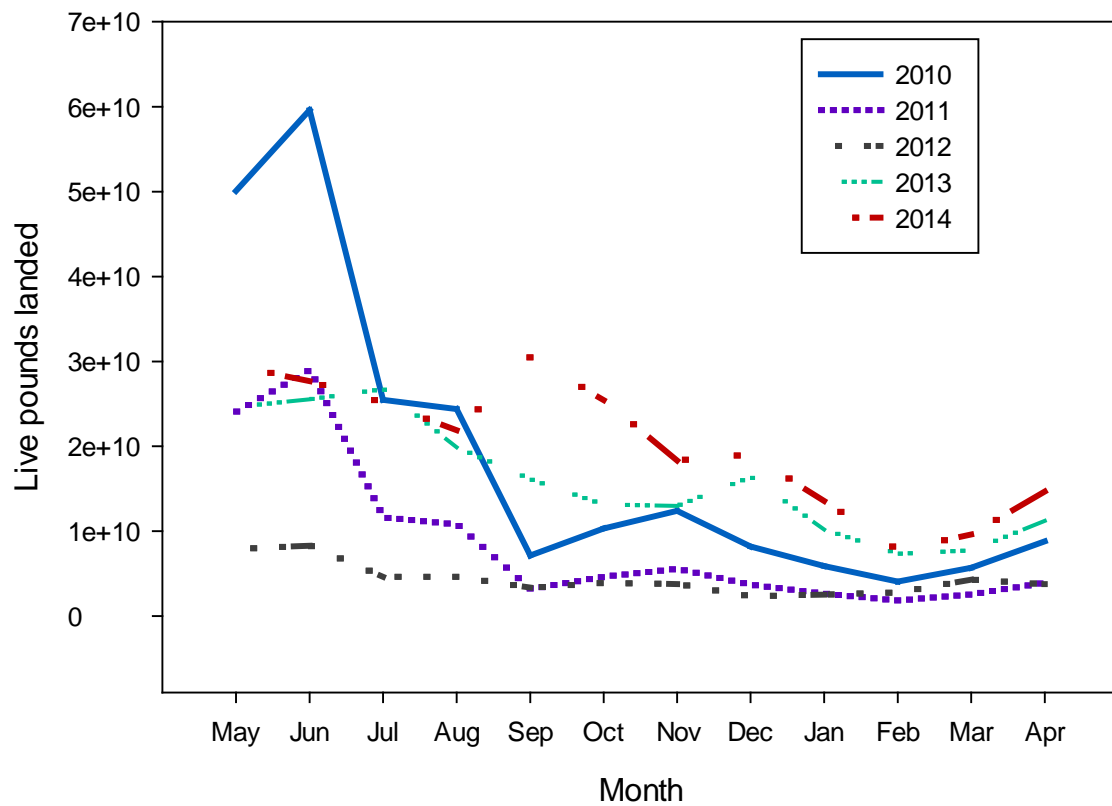
#### 1.1.4 Wing Fishery Seasonal Management Alternatives

##### 1.1.5 Option 1: No Action

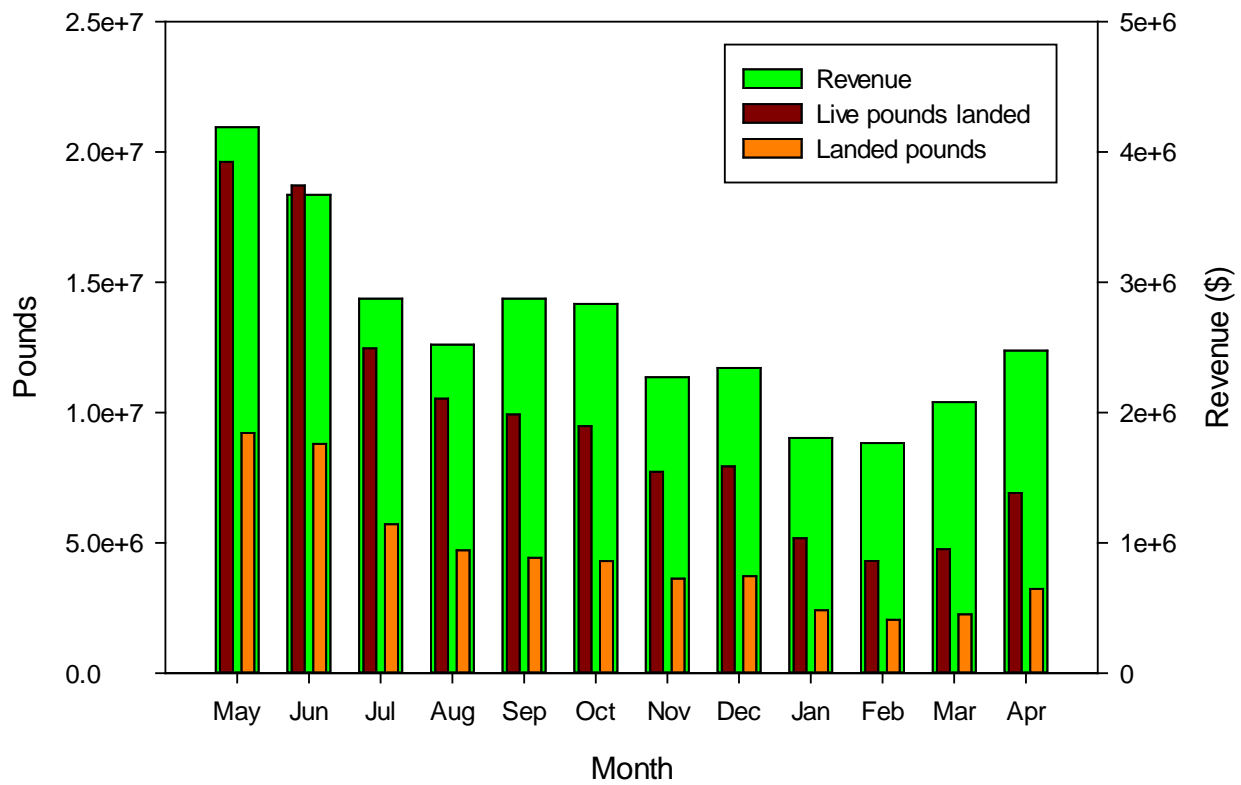
The No Action alternative would maintain the seasonal structure established in Framework Adjustment 1 for skate wing possession limits. The fishing year would remain divided into two seasons: season 1 (May 1 to Aug 31) and season 2 (Sep 1 to Apr 30). This would maintain the current levels of fishing opportunities for vessels. Therefore no change in fishing effort would be expected under Option 1. Additional risks to species that go above and beyond what has been considered are not expected. Therefore the status quo conditions would not be expected to result in additional takes of species that would jeopardize them.

##### 1.1.6 Option 2: Modification of Wing fishery Seasonal Management

This alternative would create seasonal TALs for the wing fishery consistent with the existing seasonal skate wing possession limits. The first season would be allocated XX % of the annual TAL (representing XX,XXX in 2016 and 2017) for May 1 to August 31. The second season would be allocated XX% of the annual TAL (representing XX,XXX in 2016 and 2017) for September 1 to April 30. Once 85% of the allocated TAL is reached between September 1 and April 30, the Regional Administrator would have the discretion to implement the incidental possession limit if the fishery is projected to exceed the TAL. The impact of possession limits on fishing effort is unknown as skates are typically landed on trips targeting groundfish, monkfish or scallops. Therefore it is not clear that changing the skate possession limit changes the level of overall fishing effort. There is a fairly consistent trend in monthly landings with higher amounts of live pounds landed occurring in the summer months, with the lowest live pounds landed typically occurring in February (Figure 5). Figure 6 shows aggregated landings in live pounds and landed pounds over FY2010 to FY2014 in addition to associated revenues. Option 2 would be expected to affect the timing of fishing more than the amount and location of fishing occurring, unless effort shifted to areas with reduced encounters with skates but this shift would not be expected to move to a different statistical area.



**Figure 5 – Monthly landings (live pounds) in the wing fishery (disposition food) for FYs 2010-2014**



**Figure 6 – Total live pounds landed, landed pounds and revenue for the wing fishery (disposition food) for FYs2010-2014**

Figure 6 indicates that higher revenues from skate wings (disposition food) typically occur from May until October for FYs2010-2014. August has typically shown lower revenues over the same time period, however, lowest values were observed in February.

Option 2 would have neutral to low negative impacts on the skate resources as it apportions part of the annual quota to each season; low negative impacts could occur if the incidental trip limit was implemented in either season, which would increase discards.

### 1.1.7 Option 3: Revised Skate Wing Seasonal Structure

This alternative would create seasonal TALs for the wing fishery consistent with the existing seasonal skate wing possession limits. The first season would be allocated XX % of the annual TAL (representing XX,XXX in 2016 and 2017) for May 1 to August 31. Between August 1 and September 15, the incidental possession limit of 500 lbs would be implemented, regardless of whether the in-season trigger point had been reached. The second season would be allocated XX% of the annual TAL (representing XX,XXX in 2016 and 2017) for September 1 to April 30. Once 85% of the allocated TAL is reached between September 1 and April 30, the Regional Administrator would have the discretion to implement the incidental possession limit if the fishery is projected to exceed the TAL. The impact of possession limits on fishing effort is unknown as skates are typically landed on trips targeting groundfish, monkfish or scallops. Therefore it is not clear that changing the skate possession limit changes the level of fishing effort. The mandated incidental possession limit would reduce directed fishing effort on skates, which may affect the amount of fishing occurring in that time period. Vessels may shift fishing effort to areas of

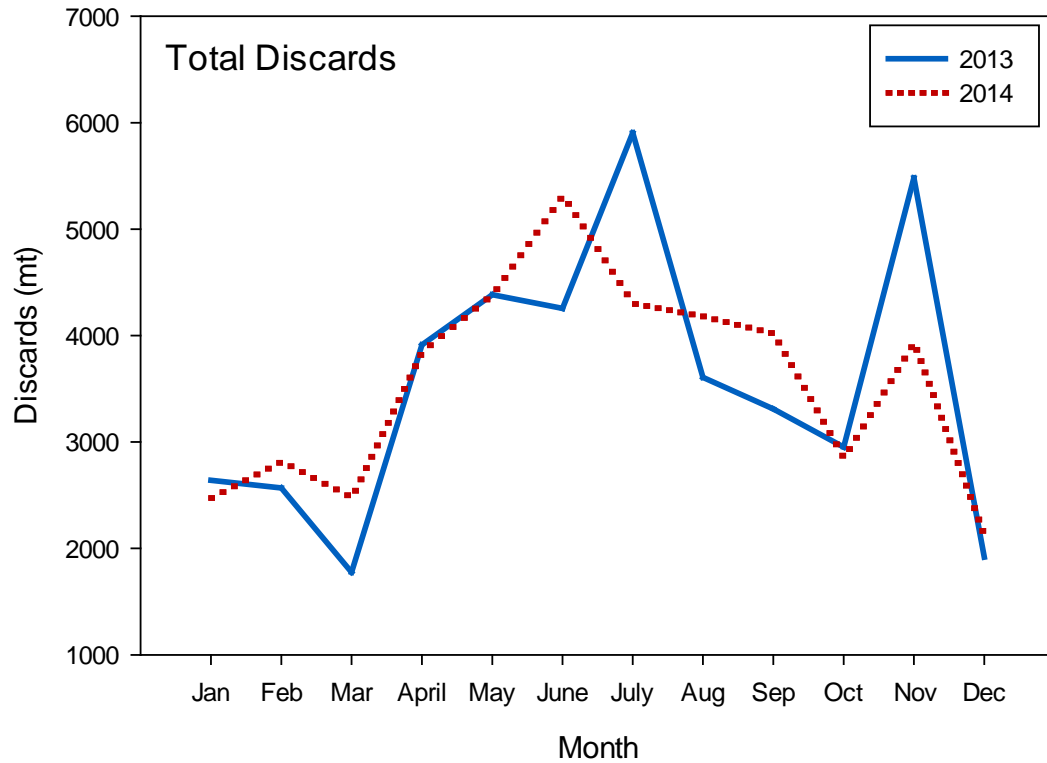
lower skate density to reduce skate encounters that can be time consuming, however, the shift would not be expected to move to a different statistical area.

Option 3 would have similar impacts to Option 2 with regards to the seasonal apportioning of annual TAL and the structure of the in-season triggers. However, Option 3 would also require a mandatory period of incidental trip limit from August to mid-September. Figure 6 shows lower landings occurring in August over the most recent 5 fishing years, this suggests that the overall fishery would be affected by the mandatory incidental trip limit but the impact would be less than if it was to occur earlier in the summer.

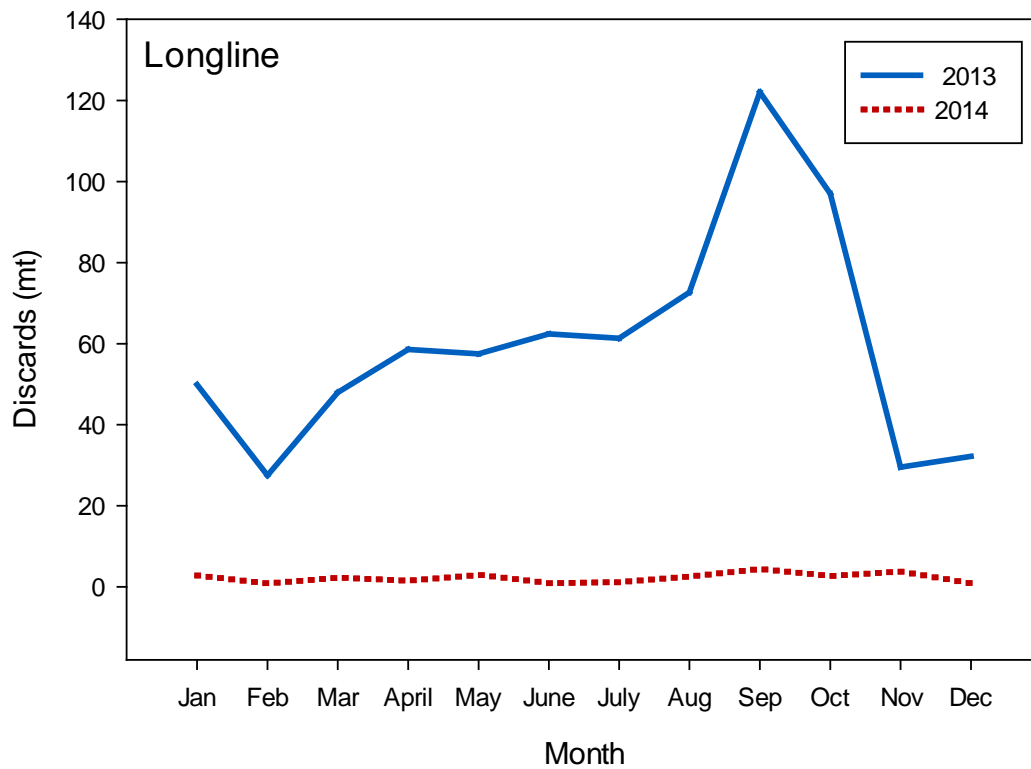
The incidental trip limit would affect the skate resource if it increased discards. As discussed under Section 1.1.1.2, increased discards could affect future specifications and would not benefit skates in rebuilding plans. Annual discards were examined for all gear types for 2013 and 2014 (Figure 7); as noted above, discards in these two years were higher than those observed in 2012. Discards between 2013 and 2014 were variable with month. Focusing on the period of mandatory incidental trip limit, August and September had moderate levels of overall discards, compared to the rest of the year. Magnitude of discards varies with gear type, suggesting that a FMP wide application of this may have differing impacts on discards. Discards attributed to otter trawl gear dominate overall discards. Discards attributed to longline gear are relatively low, however, in 2013 discards peaked in September in this gear type (Figure 8). Discards attributed to otter trawl gear represent the largest contribution to discards and show a peak in discards in mid-summer and late fall (Figure 9). Overall discards attributed to gillnet gear were relatively low (Figure 10) in 2013 and 2014. The data do show discards in August and September to be relatively low. Discards from scallop dredge gear were the second highest contributors to total discards but showed different patterns between 2013 and 2014 (Figure 11).

The number of trips occurring each month indicates that a relatively high number of trips are still occurring in August and September over the last 5 fishing years (Figure 12). The annual breakdown of trips by individual fishing year shows a similar annual pattern but also suggests that the overall number of trips may have decreased in FY2013 and FY2014, at a time when discards increased (Figure 13).

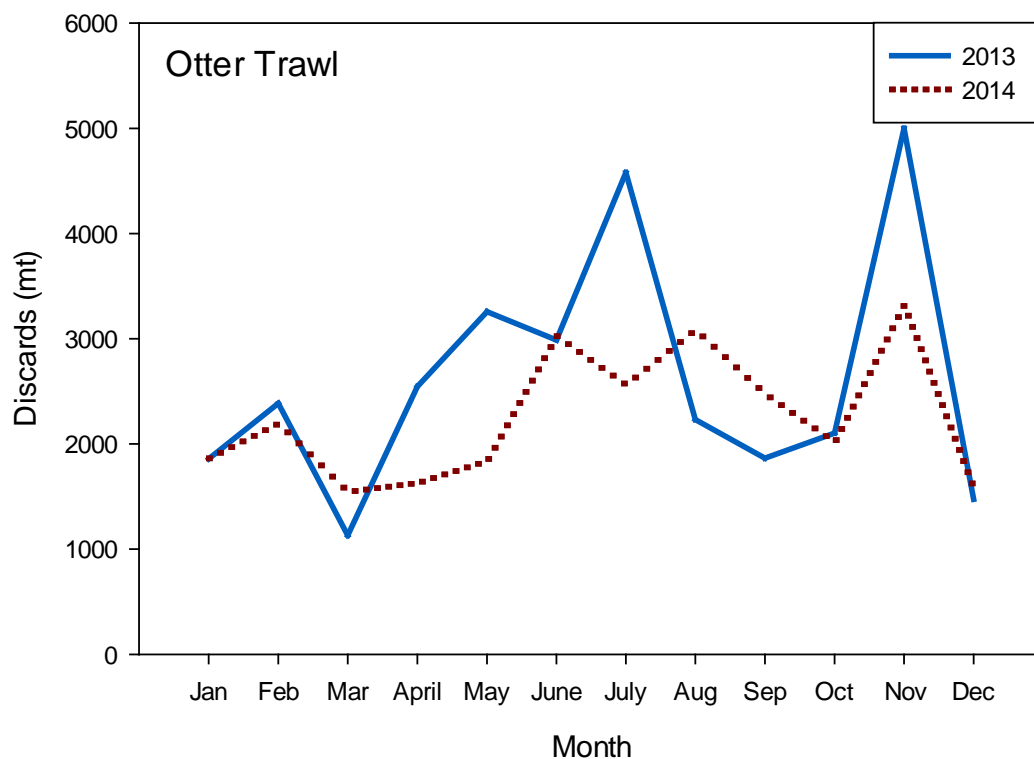
Option 3 would have neutral to low negative impacts on the skate resources as it apportions part of the annual quota to each season and has a trigger in each season for the incidental trip limit; low negative impacts would occur if the incidental trip limit increased overall discards from August 1 to September 15.



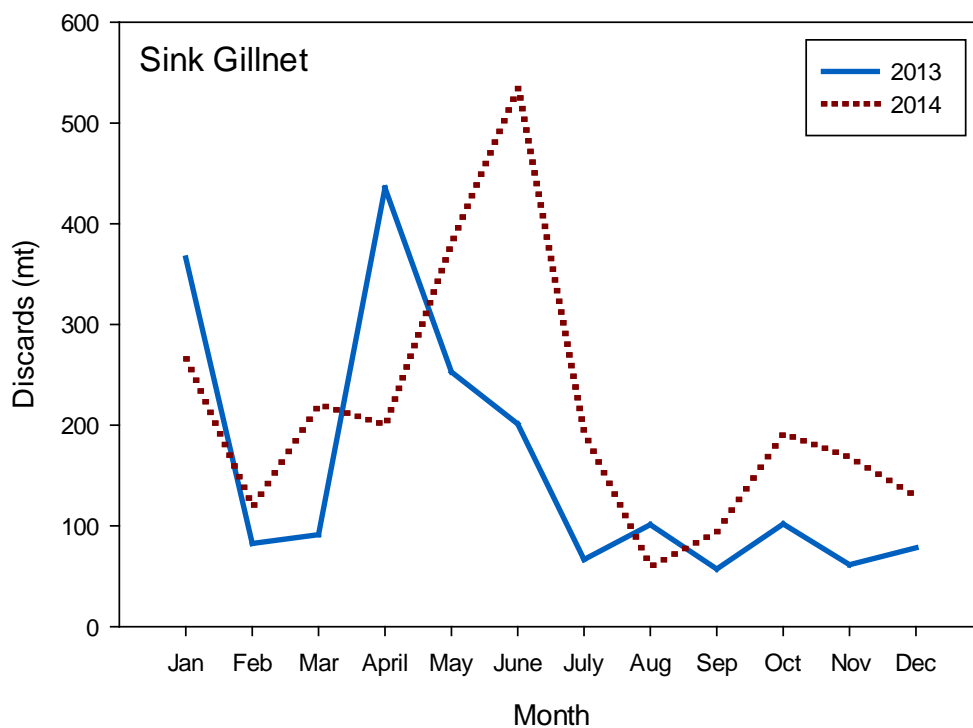
**Figure 7 - Total skate discards (in mt) for calendar years 2013 and 2014**



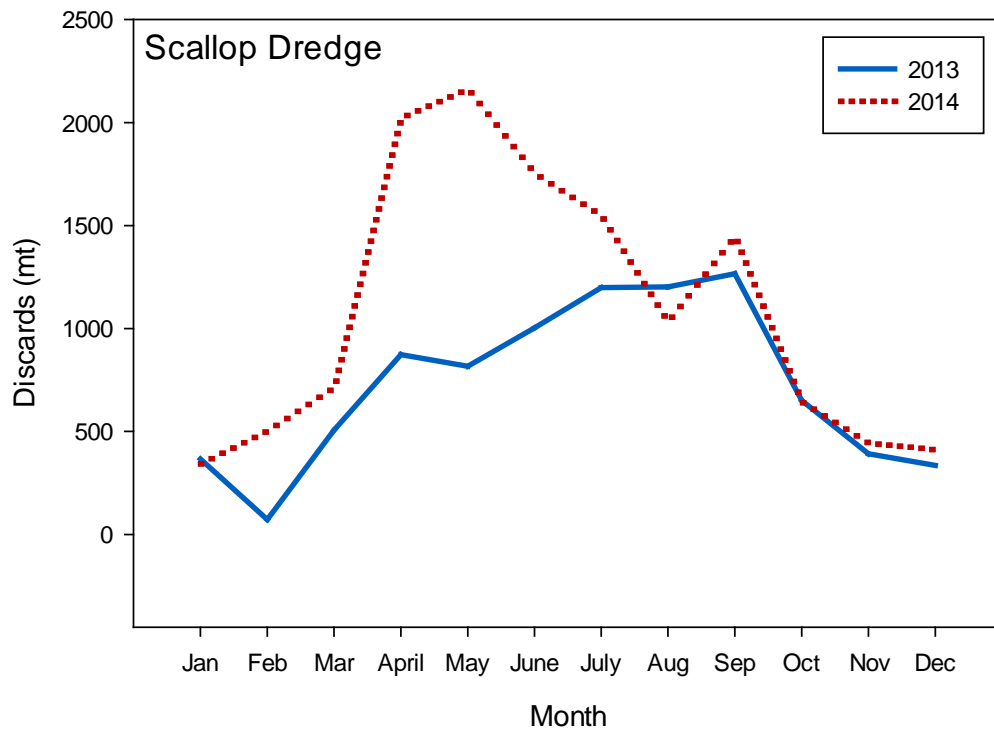
**Figure 8 - Longline skate discards (in mt) for calendar years 2013 and 2014**



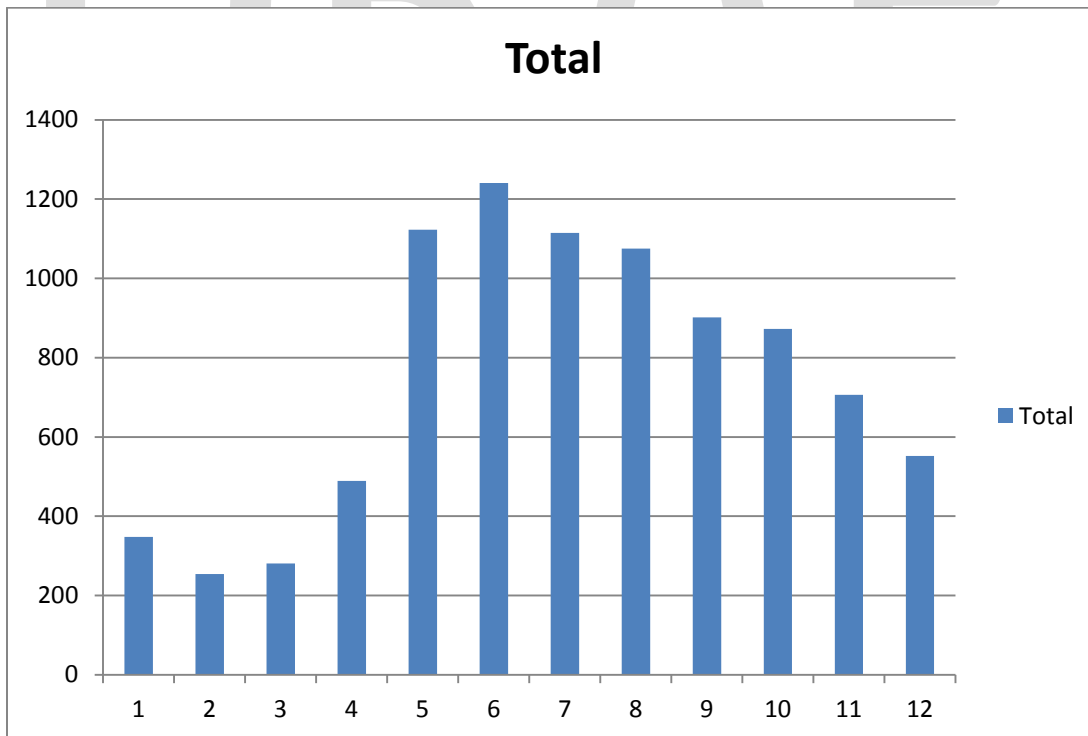
**Figure 9 - Otter trawl skate discards (in mt) for calendar years 2013 and 2014**



**Figure 10 - Sink Gillnet skate discards (in mt) for calendar years 2013 and 2014**



**Figure 11 - Scallop dredge skate discards (in mt) for calendar years 2013 and 2014**



**Figure 12 - Count of trips by month for FYs 2010-2014**

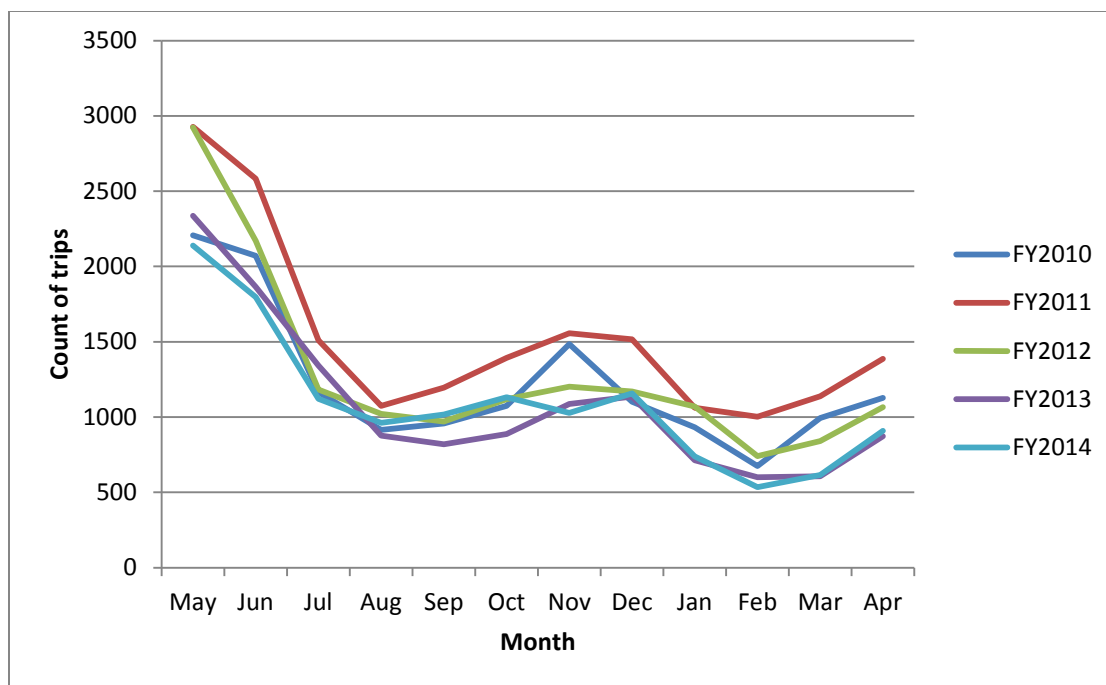


Figure 13 - Count of trips in the wing fishery (disposition food) by FY

## 1.2 Biological Impact on non-target species and other discarded species

### 1.2.1 Annual Catch Limit Alternatives

The skate wing fishery is largely an incidental fishery prosecuted during fishing under other FMPs as previously mentioned. Catch of non-skate species on trips landing skates are controlled by the DAS limits, sector rules, or other discard limiting measures in other FMPs. For information regarding recent limits in other fisheries, please refer to the discussion of cumulative effects (Section **Error! Reference source not found.**). On the small portion of trips where skates are directly targeted, common non-target species include monkfish and spiny dogfish.

Vessels that target skates in lieu of other fish while on a DAS are likely to catch and possibly discard lower amounts of other species. Because these discards are controlled by measures in other fisheries, the impacts to non-skate species from annual catch limit alternatives are negligible above those already analyzed for actions in the other FMPs.

### 1.2.2 Skate Wing Possession Limit Alternatives

The Skate FMP requires that all vessels landing skates on a DAS trip comply with the wing possession limit; any non-DAS trip has an incidental trip limit of 500 lbs of skate wing. If fishing effort is similar to FY2014, higher trip limits would be more likely to trigger the incidental trip limit. The incidental trip limit would result in less fishing for skates and possibly increased targeting of other species to make up the difference in skate landings and revenue. Because the catch of the other species, including landings

and discards, are accounted for under other FMPs, the wing possession limit alternatives are expected to have negligible impacts to non-skate species above those already analyzed for actions in the other FMPs.

DRAFT